

Norway lobster (*Nephrops norvegicus*) in Division 7.a, Functional Unit 15 (Irish Sea, West)

ICES advice on fishing opportunities

ICES advises that when the EU multiannual plan (MAP) for Western waters and adjacent waters is applied, catches in 2020 that correspond to the F ranges in the MAP are between 7070 tonnes and 10 377 tonnes. The entire range is considered precautionary when applying the ICES advice rule.

To ensure that the stock in Functional Unit (FU) 15 is exploited sustainably, management should be implemented at the functional unit level.

Stock development over time

Since 2003, stock abundance has been above $MSY B_{trigger}$. In the last decade the harvest rate has fluctuated around F_{MSY} and has been below F_{MSY} since 2016.

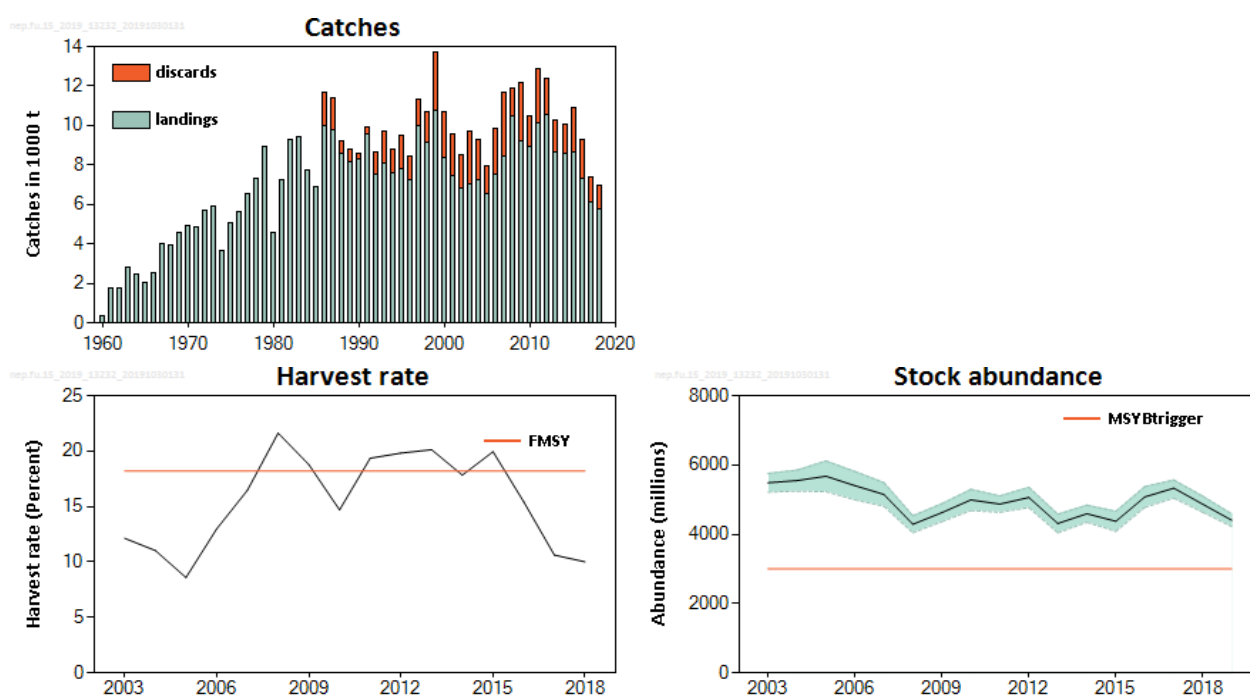


Figure 1 Norway lobster in Division 7.a, Functional Unit 15. Summary of the stock assessment. Catches (discard data are only available from 1986), harvest rate (sum of landings and dead discards in numbers, divided by total abundance), and stock abundance (underwater TV survey, in billions; 95% confidence intervals). Harvest rates between 2003 and 2006 may be unreliable because of underreporting of landings. Orange lines represent the F_{MSY} harvest rate and $MSY B_{trigger}$.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below F_{MSY} , and that spawning stock size is above MSY $B_{trigger}$.

Table 1 Norway lobster in Division 7.a, Functional Unit 15. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size			
		2016	2017	2018		2017	2018	2019	
Maximum sustainable yield	F_{MSY}	✓	✓	✓	Below	MSY $B_{trigger}$	✓	✓	✓ Above trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓	Below possible reference points	B_{pa}, B_{lim}	✓	✓	✓ Above possible reference points
Management plan	F_{MGT}	✓	✓	✓	Below range	B_{MGT}	✓	✓	✓ Above trigger

Catch scenarios

Table 2 Norway lobster in Division 7.a, Functional Unit 15. The basis for the catch scenarios.

Variable	Value	Notes
Stock abundance (2020)	4.4 billion	UWTV survey 2019 (number of individuals)
Mean weight in wanted catch	14.5 grammes	Average 2016–2018
Mean weight in unwanted catch	7.79 grammes	Average 2016–2018
Unwanted catch	28.5%	Average 2016–2018 (proportion by number)
Discards survival	10%	Proportion by number
Dead unwanted catch	26.4%	Average 2016–2018 (proportion by number)

Table 3 Norway lobster in Division 7.a, Functional Unit 15. Annual catch advice and scenarios; discarding is assumed to continue at the recent average. All weights are in tonnes. The figures in the table are rounded. Calculations were done with unrounded inputs and computed values may not match exactly when calculated using the rounded figures in the table.

Catch scenarios assuming recent discard rates

Basis	Total catch	Dead removals	Wanted catch	Dead unwanted catch	Surviving unwanted catch	Harvest rate * %	% advice change **
	WC + DUC + SUC	WC + DUC	WC	DUC	SUC	for WC + DUC	
ICES advice basis							
EU MAP \wedge : F_{MSY}	10377	10194	8546	1648	183	18.2	-6.6
$F= MAP F_{MSY lower}$	7070	6945	5823	1122	125	12.4	-36
$F = MAP F_{MSY upper}^{***}$	10377	10194	8546	1648	183	18.2	-6.6
Other options							
MSY approach	10377	10194	8546	1648	183	18.2	-6.6
F_{2018}	5701	5601	4696	905	101	10.0	-49

Catch scenarios assuming zero discards

Basis	Total catch	Wanted catch	Unwanted catch	Harvest rate *	% advice change **
	WC + UC	WC	UC	for WC + UC	
ICES advice basis					
EU MAP ^: F _{MSY}	10081	8302	1779	18.2	-9.2
F= MAP F _{MSY lower}	6868	5657	1212	12.4	-38
F = MAP F _{MSY upper} ***	10081	8302	1779	18.2	-9.2
Other options					
MSY approach	10081	8302	1779	18.2	-9.2
F ₂₀₁₈	5539	4562	977	10.0	-50

* By number.

** Advice value 2020 relative to the advice value 2019 (11 107 tonnes).

*** $F_{MSY upper} = F_{MSY}$ for this stock.

\wedge EU multiannual plan (MAP) for the Western waters and adjacent waters (EU, 2019).

The advice for 2020 is lower than that for 2019, because of a lower estimated stock abundance.

Basis of the advice

Table 4 Norway lobster in Division 7.a, Functional Unit 15. The basis of the advice.

Advice basis	The EU multiannual plan (MAP) for stocks in the Western waters and adjacent waters (EU, 2019)
Management plan	<p>The EU multiannual plan (MAP) for stocks in the Western waters and adjacent waters applies to this stock. The plan specifies conditions for setting fishing opportunities depending on stock status and making use of the F_{MSY} range for the stock.</p> <p>In accordance with the MAP, catches higher than those corresponding to F_{MSY} can only be taken providing SSB is greater than $MSY B_{trigger}$, and one of the following conditions is met:</p> <ul style="list-style-type: none"> a) if it is necessary for the achievement of objectives of mixed fisheries; b) if it is necessary to avoid serious harm to a stock caused by intra- or inter-species stock dynamics; c) in order to limit variations in fishing opportunities between consecutive years to not more than 20%. <p>ICES considers that the F_{MSY} range for this stock used in the MAP is precautionary.</p> <p>Full details of the plan are described in EU (2019).</p>

Quality of the assessment

An annual underwater television survey (UWTV) has taken place since 2003, which gives abundance estimates for FU 15 (Figure 2) with high precision. The quality of input data and level of sampling for this stock are good.

Issues relevant for the advice

From 2016 the EU landing obligation was applied to all catches of Norway lobster fisheries in ICES Subarea 7, with several exemptions. Observations from the 2016–2018 fishery indicate that discarding above the minimum conservation reference size (MCRS) continues and has not changed markedly (Figure 3). Consequently, ICES is providing advice for 2020 assuming average discard rates as observed over the last three years. This is considered to be the most realistic assumption.

The survival rate of discards of 10% assumed for FU14 and FU 15 is lower than that for other stocks because fishing practices are similar in these two FUs and both are largely spring/summer fisheries where animals discarded are exposed to warmer temperatures.

ICES notes that catches in Subarea 7 have been less than the TAC in recent years, as there has been a general decline in trawling fishing effort for Norway lobster (ICES, 2019).

The density of *Nephrops* in FU 15 is considered very high (average density 0.76 individuals m^{-2} in 2019) compared to other FUs. A harvest rate consistent with a combined-sex F_{MAX} of 18.2% is considered an appropriate proxy for F_{MSY} . Whilst harvest rates had previously been above F_{MSY} and the stock size has been stable at a high level, harvest rates since 2016 have been below F_{MSY} .

A single TAC covers the entire ICES Subarea 7. Management should be implemented at the functional unit level to ensure that fishing opportunities are in line with the scale of the resource for each of the stocks, as well as the corresponding maximum sustainable yield (MSY) approach.

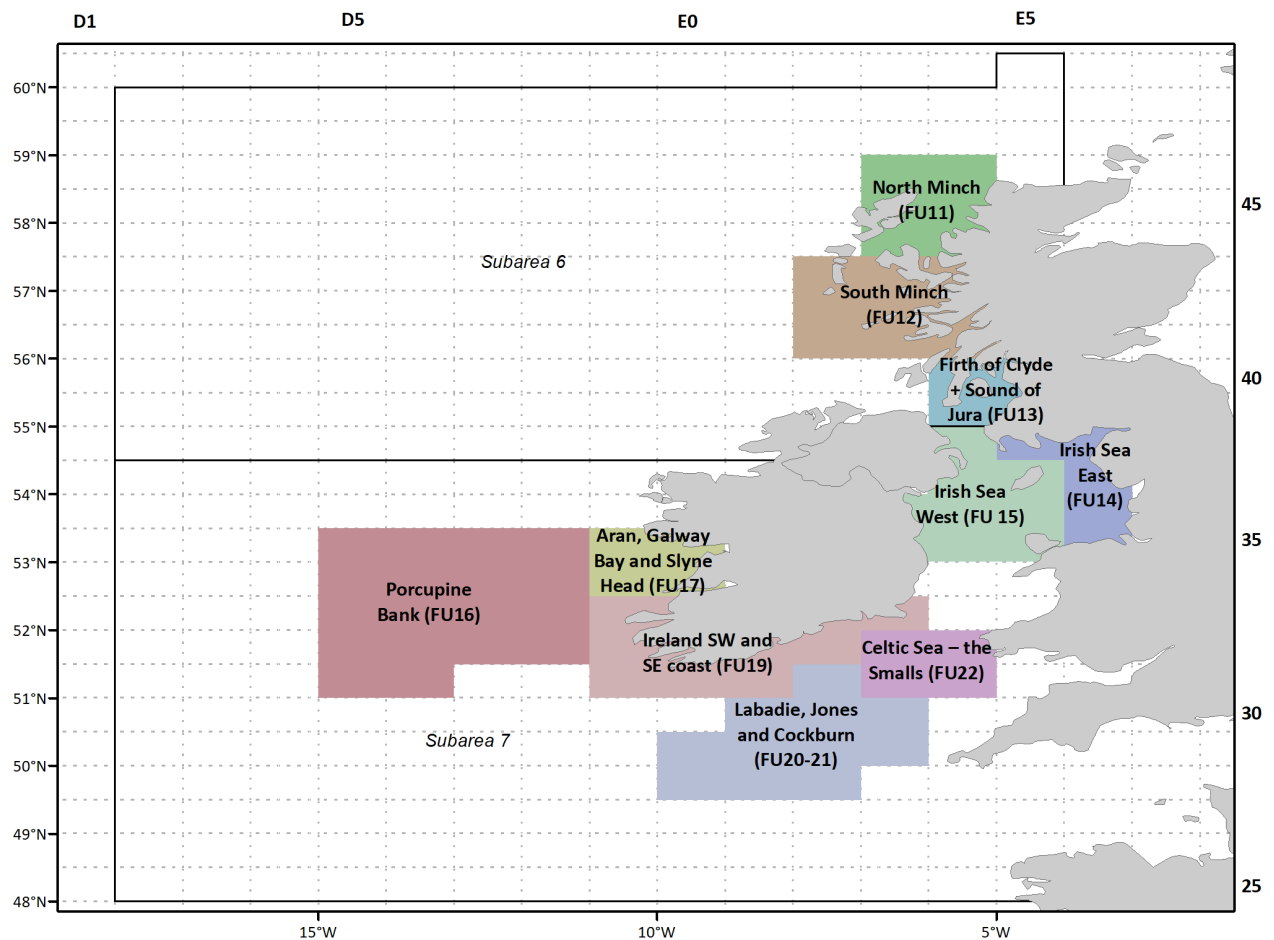


Figure 2 Norway lobster functional units in subareas 6 and 7.

Reference points

Table 5 Norway lobster in Division 7.a, Functional Unit 15. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	3 billion individuals	Minimum abundance observed based on a scaled trawl survey index.	ICES (2016)
	F_{MSY}	18.2% harvest rate	F_{MSY} proxy equivalent to F_{max} for combined sexes, derived from a length-based per recruit analysis.	ICES (2016)
Precautionary approach	B_{lim}	Not defined		
	B_{pa}	Not defined		
	F_{lim}	Not defined		
	F_{pa}	Not defined		
Management plan	MAP MSY $B_{trigger}$	3 billion individuals	MSY $B_{trigger}$	EU (2019), ICES (2016)
	MAP B_{lim}	Not defined		
	MAP F_{MSY}	18.2% harvest rate	F_{MSY}	EU (2019), ICES (2016)
	MAP range F_{lower}	12.4–18.2% harvest rate	Consistent with ranges provided by ICES (2016), resulting in no more than 5% reduction in long-term yield compared with MSY.	EU (2019), ICES (2016)
	MAP range F_{upper}	18.2–18.2% harvest rate	F_{MSY} upper value capped at F_{MSY} because it has not been possible to evaluate the probability of $SSB < B_{lim}$ (ICES, 2016).	EU (2019), ICES (2016)

Basis of the assessment

Table 6 Norway lobster in Division 7.a, Functional Unit 15. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018).
Assessment type	Underwater TV survey (ICES, 2019).
Input data	One survey index (UWTV in FUs 14–15); commercial catches (international landings, length frequencies from catch sampling); fixed maturity ogive based on survey sampling, fixed natural mortality; discard survival rate.
Discards and bycatch	Included in the assessment since 2003.
Indicators	Length–frequency distributions of the catches by sex. CPUE from <i>Nephrops</i> trawl survey.
Other information	The latest benchmark (based on the UWTV survey) was performed in 2009 (ICES, 2009).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

Information from stakeholders

There is no additional available information for this stock.

History of the advice, catch, and management

Table 7 Norway lobster in Division 7.a, Functional Unit 15. ICES advice, landings, and discards. All weights are in tonnes.

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings	Total discards *
1989					8128	673
1990					8300	276
1991					9554	345
1992				8900	7541	1079
1993				9400	8102	1622
1994				9400	7606	1185
1995				9400	7796	1724
1996				9400	7247	1202
1997				9400	9971	1330
1998				9400	9128	1560
1999				9400	10786	2913
2000				9400	8370	2293
2001				9400	7441	2112
2002	Set TAC in line with 1995–1999 landings			9550	6793	1732
2003	Set TAC in line with 1995–1999 landings			9550	7065	2659
2004	Set TAC in line with 1995–1999 landings			9550	7270	1993
2005	Set TAC in line with 1995–1999 landings			9550	6554	1412
2006	No increase in effort			9550	7561	2285
2007	No increase in effort	-		-	8491	3246
2008	No increase in effort	-		-	10508	1421
2009	No increase in effort and landings	< 8500			9198	2934
2010	Harvest rate no greater than the equivalent to fishing at $F_{0.1}$	< 5500			8963	1539
2011	Transition scheme towards the ICES MSY framework	< 9500			10162	2683
2012	MSY approach	< 9800			10529	1871
2013	MSY approach	< 9300			8672	1590
2014	MSY approach	< 8200			8613	1418
2015	MSY approach	< 8223			8643	2228

Year	ICES advice	Landings advice	Catch advice	Recommended landings (FUs 14 + 15)	ICES landings	Total discards *
2016	MSY approach		≤ 8682**		7327	1939
2017	MSY approach		≤ 11248***		6150	1222
2018	MSY approach		≤ 11807***		5756	1231
2019	MSY approach		≤ 11107***			
2020	Management plan		10377 (range 7070–10377)***			

* Dead + surviving discards.

** Assuming all catches are landed.

*** Assuming recent discard rates.

History of the catch and landings

Table 8 Norway lobster in Division 7.a, Functional Unit 15. Catch distribution by fleet in 2018 as estimated by ICES. All weights are in tonnes.

Catch		Landings		Discards	
98.2% dead	1.8% surviving	99.8% <i>Nephrops</i> otter trawls (70–99 mm)	0.2% creels	90% dead	10% surviving
6987 t		5756 t		1231 t	

Table 9 Norway lobster in Division 7.a, Functional Unit 15. History of ICES estimates of landings by country and discards. All weights are in tonnes.

Year	Ireland	UK	UK (E&W)	UK (NI)	UK (Scotland)	UK (Isle of Man)**	Total landings	Discards*
1965		1018					1018	
1966		1701					1701	
1967		2077					2077	
1968		1987					1987	
1969	1011	2803					3814	
1970	1392	3001					4393	
1971	1384	3190					4574	
1972	1604	4120					5724	
1973	1863	4031					5894	
1974	982	2689					3671	
1975	909	4165					5074	
1976	1614	3989					5603	
1977	2469	4045					6514	
1978	2921	4375					7296	
1979	3436	5512					8948	
1980	1709	2869					4578	
1981	3202	4047					7249	
1982	4398	4917					9315	
1983	4324	5124					9448	
1984	3306	4454					7760	
1985	2421	4480					6901	
1986	4682	5296					9978	1680
1987	4639	5114					9753	1608
1988	3201	5385					8586	639
1989	2477	5651					8128	673
1990	2710	5590					8300	276
1991	3371	6183					9554	345
1992	2370	5171					7541	1079
1993	2715	5387					8102	1622
1994	1768	5838					7606	1185
1995	2259	5538					7796	1724
1996	1574	5673					7247	1202
1997	3349	6622					9971	1330
1998	3101	6027					9128	1560

Year	Ireland	UK	UK (E&W)	UK (NI)	UK (Scotland)	UK (Isle of Man)**	Total landings	Discards*
1999	4582	6198				6	10786	2913
2000	3433	4937				0	8370	2293
2001	2689	4749				3	7441	2112
2002	2291	4501				1	6793	1732
2003	2709	4352				4	7065	2659
2004	2786	4470				13	7270	1993
2005	2133	4420				0	6554	1412
2006	2051		56	5429	23	1	7561	2285
2007	2767		102	5585	36	0	8491	3246
2008	3132		131	7166	26	50	10508	1421
2009	2343		200	6622	32	1	9198	2934
2010	2578		100	6251	33	0	8963	1539
2011	3575		88	6444	52	2	10162	2683
2012	3794		106	6586	39	3	10529	1871
2013	2465		56	6069	50	31	8672	1590
2014	2938		88	5558	29	-	8613	1418
2015	2202		26	6404	11	-	8643	2228
2016	1609		52	5638	25	-	7327	1939
2017	1253		81	4789	26	-	6150	1222
2018	1387		69	4293	7	-	5756	1231

* Dead + surviving discards.

** Since 2014 included in UK (E&W) landings.

Summary of the assessment

Table 10 Norway lobster in Division 7.a, Functional Unit 15. Assessment summary.

Year	UWTV abundance estimate	95% Confidence Interval	Landings in number	Total discards in number*	Removals in number	Harvest rate (by number)	Landings	Total discards*	Discard rate (by number)	Dead discard rate (by number)	Mean weight in landings	Mean weight in discards
	billions		millions			%	tonnes		%		grammes	
2003	5.5	0.255	404	291	666	12.1	7065	2659	41.9	39.3	17.5	9.14
2004	5.5	0.237	416	218	612	11.0	7270	1993	34.4	32.0	17.5	9.14
2005	5.7	0.327	346	157	488	8.6	6554	1412	31.2	29.1	18.9	8.99
2006	5.4	0.314	467	261	701	13.0	7561	2285	35.9	33.4	16.2	8.75
2007	5.1	0.228	511	375	848	16.5	8491	3246	42.3	39.7	16.6	8.66
2008	4.3	0.144	755	191	927	21.6	10508	1421	20.2	18.6	13.9	7.44
2009	4.6	0.190	567	335	868	18.8	9198	2934	37.1	34.7	16.2	8.76
2010	5.0	0.198	572	180	733	14.7	8963	1539	23.9	22.0	15.7	8.55
2011	4.9	0.176	644	332	943	19.4	10162	2683	34.0	31.7	15.8	8.08
2012	5.1	0.249	771	258	1003	19.8	10529	1871	25.1	23.1	13.7	7.25
2013	4.3	0.174	662	229	867	20.1	8672	1590	25.7	23.6	13.1	6.94
2014	4.6	0.161	641	198	819	17.8	8613	1418	23.6	21.7	13.4	7.16
2015	4.4	0.202	620	280	872	19.9	8643	2228	31.1	28.9	13.9	7.96
2016	5.1	0.232	562	245	783	15.4	7327	1939	30.4	28.2	13.0	7.91
2017	5.3	0.267	426	152	563	10.6	6150	1222	26.3	24.3	14.4	8.04
2018	4.9	0.188	360	145	491	10.0	5756	1231	28.7	26.6	16.1	7.43
2019	4.4	0.183										

*Dead + surviving discards.

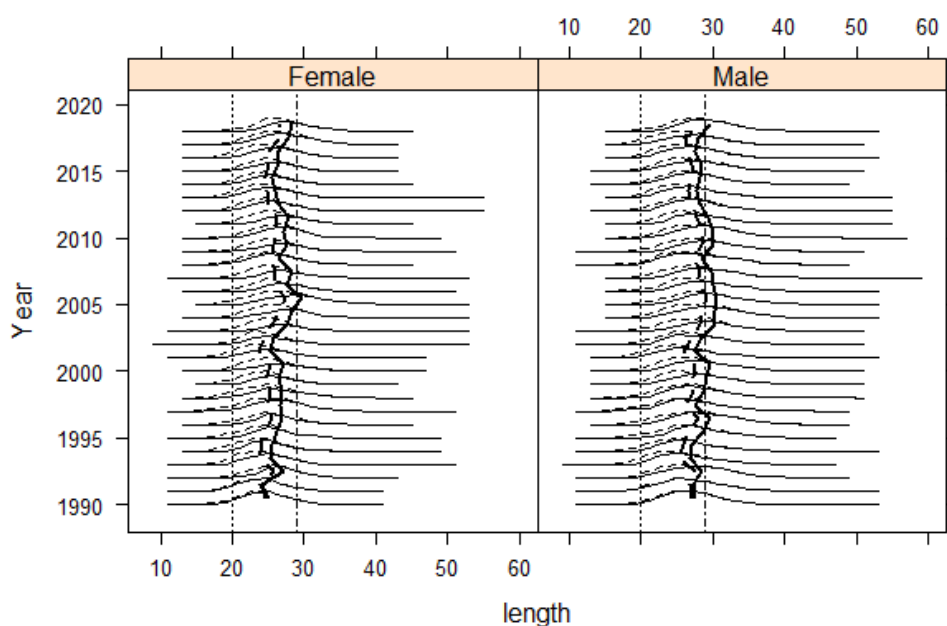


Figure 3 Norway lobster in Division 7.a, Functional Unit 15. Catch length–frequency distribution and mean size in catches (dotted lines) and landings (solid lines). The vertical lines indicate the minimum conservation reference size (20 mm) and the 29 mm visual reference level.

Sources and references

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